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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SORKIN, DAVID L

ART UNIT PAPER NUMBER

1723

DATE MAILED: 02/20/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/042,128

Applicant(s)

ZHA ET AL.

Examiner

David L. Sorkin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-32, drawn to a membrane module and methods of cleaning, classified in class 210, subclass 636.
  - II. Claim 33, drawn to a method of molding, classified in class 264, subclass 41.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the openings could be made by another process, such a drilling.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Rose Thiessen on 03 February 2003 a provisional election was made without traverse to prosecute the invention of Group I,

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claims 1-32. Affirmation of this election must be made by applicant in replying to this Office action. Claim 33 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Drawings***

7. Entry of Fig. 16, filed 08 April 2002, is approved, although the copy filed is not considered "formal". A formal copy with uniform line thickness will be required upon any allowance. Applicant is advised that 35 U.S.C. 113 states, "Drawings submitted after the filing date of the application may not be used (i) to overcome any insufficiency of the specification due to lack of an enabling disclosure or otherwise inadequate disclosure therein, or (ii) to supplement the original disclosure thereof for the purpose of interpretation of the scope of any claim."

### ***Suggestions***

8. It is suggested that applicant address the following issues to improve the clarity of the claims:

9. In claim 1, there is lack of antecedent basis for "the porous membrane array".

10. In claim 4, there is lack of antecedent basis for "the fibre membranes".

11. In claim 5, there is lack of antecedent basis for "the fibre membranes".

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12. In claim 14, "is used in conjunction with" should be rephrased to clarify that the porous sheet is part of the claimed structure.
13. In claim 20, there is lack of antecedent basis for "the lower end" and "their upper end".
14. In claim 30, there is lack of antecedent basis for "the lower end".
15. In claim 31, there is lack of antecedent basis for "said fibers".
- 16.

***Claim Rejections - 35 USC § 102***

17. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

18. Claims 1-7, 9-17, and 19-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Sunaoka (US 5,209,852). Regarding claim 1, Sunaoka ('852) discloses a method of removing fouling materials from the surface of a plurality of porous membranes (2) arranged in a membrane module (1) by providing, from within the module (through apertures 7), by means other than gas passing through the pores of said membranes (gas remains outside the hollow fibers and scrubs the outside surface, see abstract), gas bubbles in a uniform distribution relative to the porous membranes (fig. 7 depicts a uniform distribution of bubble apertures 7 relative to membranes 2) such that said bubbles move past the surfaces of and vibrate said membranes to dislodge fouling materials therefrom (col. 8, lines 13 to 17), said membranes being arranged in

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close proximity to one another and mounted to prevent excessive movement therebetween (column 3, line 39). Regarding claim 2, it is considered that vibrating membranes bundled together intrinsically rub (See column 3, line 39). Regarding claim 3, the porous membranes comprise hollow fiber membranes (2). Regarding claim 4, the membranes are arranged in bundles (column 3, line 39) surrounded by a perforated cage (3). Regarding claim 5, the method of Sunaoka ('852) includes the step of providing gas bubbles from within the module by means of gas distribution holes (7) in a pot (5) used to mount the membranes. Regarding claim 6: The method of Sunaoka ('852) includes the step of providing gas bubbles from within the module by means of at least one porous tube (5) located within the module. Regarding claim 7, the method of Sunaoka ('852), includes the step of providing gas bubbles from within the module by means of a tube or tubes (5) located within the module. Regarding claim 9, Sunaoka ('852) discloses a membrane module (1) comprising a plurality of porous membranes (2) said membranes being arranged in close proximity to one another and mounted to prevent excessive movement therebetween (column 3, line 39), and means for providing, from within the module (through apertures 7), by means other than gas passing through the pores of said membranes (gas remains outside the hollow fibers and scrubs the outside surface, see abstract), gas bubbles such that, in use, said bubbles move past the surfaces of and vibrate said membranes to dislodge fouling materials therefrom (col. 8, lines 13 to 17). Regarding claim 10, it is considered that vibrating membranes bundled together intrinsically rub (See column 3, line 39). Regarding claim 11, the porous membranes comprise hollow fiber membranes (2).

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Regarding claim 12, the membranes are arranged in bundles (column 3, line 39) surrounded by a perforated cage (3). Regarding claim 13, gas bubbles are provided from within the module by means of gas distribution holes (7) in a pot (5) used to mount the membranes. Regarding claim 14, a porous sheet (5) is used in conjunction with the holes (7) to provide a uniform distribution of gas bubbles. Regarding claim 15, the means for providing gas bubbles from within the module includes a porous sheet (5) through which gas is supplied to provide said gas bubbles. Regarding claim 16, the means for providing gas bubbles from within the module includes at least one porous tube (5) located within the module. Regarding claim 17, the means for providing gas bubbles from within the module includes a tube or tubes (5) positioned to output gas within the module. Regarding claim 19, the membranes (2) comprise porous hollow fibres, the fibers being fixed at each end in a header (4 and 5), a lower header (5) having a plurality of holes (7) formed therein through which gas is introduced to provide bubbles. Regarding claim 20, the fibres are sealed at the lower end and open at their upper end to allow removal of filtrate (column 6, lines 21-36). Regarding claim 21, the fibres are mounted in a substantially taut manner between said headers (4 and 5) (The fibers' straight line depiction in fig. 1 combined with the fact that they vibrate is considered to show that they are substantially taut). Regarding claim 22, Sunaoka (852) discloses a membrane module (1) comprising a plurality of porous hollow membrane fibers (2) extending longitudinally between and mounted at each end to a respective potting head (4 and 5) said membranes being arranged in close proximity to one another and mounted to prevent excessive movement therebetween (column 3, line

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39), one of said potting head (5) having a distributed array of aeration holes (7) formed therein and said fibres being substantially uniformly mounted in said one potting head relative to said aeration holes (see fig. 1). Regarding claim 23, said aeration holes (7) are sized and located such that bubbles, formed by gas passing therethrough when the module is immersed in a liquid, pass substantially uniformly between each membrane (see fig. 1). Regarding claim 24, said porous membranes are arranged to be vibrated by means of said gas bubbles (col. 8, lines 13-17). Regarding claim 25, said porous membranes are mounted relatively close to one another so as to produce a rubbing effect between said membranes when vibrated (column 3, line 39). Regarding claim 26, the fibers (2) are mounted in a substantially taut manner between said potting heads (4 and 5) (The fibers' straight line depiction in fig. 1 combined with the fact that they vibrate is considered to show that they are substantially taut). Regarding claim 27, Sunaoka ('852) discloses a method of removing accumulated solids from the surface of a plurality of porous hollow fibre membranes (2) mounted and extended longitudinally in an array to form a membrane module (1) (see fig. 1), said membranes being arranged in close proximity to one another and mounted to prevent excessive movement therebetween (column 3, line 39), the method comprising the steps of providing, from within this array (through apertures 7), by means other than gas passing through the pores of said membranes (gas remains outside the hollow fibers and scrubs the outside surface, see abstract), uniformly distributed gas bubbles (fig. 7 depicts a uniform distribution of bubble apertures 7 relative to membranes 2), said distribution being such that said bubbles pass substantially uniformly between each membrane in said array to scour the



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surface of and vibrate said membranes and remove accumulated solids from within the membrane module (col. 8, lines 13-17). Regarding claim 28, it is considered that vibrating membranes bundled together intrinsically rub (See column 3, line 39).

Regarding claim 29, said membranes are mounted vertically to form said array and said bubbles pass generally parallel to the longitudinal extent of said fibres (see figs. 1 and 2 and col. 8, lines 13-17). Regarding claim 30, said uniformly distributed gas bubbles are provided at the lower end of the array (fig. 1 and 2). Regarding claim 31, Sunaoka ('852) discloses a filtration system including a membrane module (1) according to claim 9 (see above) wherein said membrane module is positioned vertically in a tank (9) containing feed liquid to be filtered, and including means to apply a transmembrane pressure (16) and to said membranes to cause filtrate to pass through pores in said fibres and means to supply continually or intermittently a supply of gas (15B,13) to said means for providing bubbles such that said bubbles move upwardly and uniformly between said fibres to scour the outer surfaces thereof (see fig. 2 and col. 8, lines 13-17). Regarding claim 32, a backwash is used in conjunction with the scouring process to assist solids removal from the membrane pores and outer surface of the membranes (col. 10, lines 58 to 64).

### ***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunaoka (852). Regarding claim 8, Sunaoka ('852) discloses the method described above with regard to claim 7. While the tube or tubes of Sunaoka (852) is not a comb of tubes, Sunaoka (852) teaches a comb of tubes (12,13). It is considered that it would have been obvious to one of ordinary skill in the art to have made the tube or tubes of Sunaoka (852) a comb of tubes because the comb of tubes is also for distributing air (col. 6, lines 56-62). Regarding claim 18, Sunaoka (852) discloses the membrane module described above with regard to claim 17. While the tube or tubes of Sunaoka (852) is not a comb of tubes, Sunaoka (852) teaches a comb of tubes (12,13). It is considered that it would have been obvious to one of ordinary skill in the art to have made the tube or tubes of Sunaoka (852) a comb of tubes because the comb of tubes is also for distributing air (col. 6, lines 56-62).

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**Double Patenting**

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 9-13 and 19-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,156,200. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 1 of US 6,156,200 includes all the limitations of instant claims 9-13 and 19-16.

24. Claims 14 and 15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 6,156,200. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 2 of US 6,156,200 includes all the limitations of instant claims 14 and 15.

25. Claim 16 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 3 of U.S. Patent No. 6,156,200. Although the conflicting claims are not identical, they are not patentably distinct from

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each other because claim 3 of US 6,156,200 includes all the limitations of instant claim 16.

26. Claim 17 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4 of U.S. Patent No. 6,156,200.

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 4 of US 6,156,200 includes all the limitations of instant claim 17.

27. Claim 18 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 5 of U.S. Patent No. 6,156,200.

Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 5 of US 6,156,200 includes all the limitations of instant claim 18.

28. Claims 1 and 3-5 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 4 of copending Application No. 09/336,059. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 4 of 09/336,059 includes all the limitations of instant claims 1 and 3-5.

29. Claims 2, 6-8, 31 and 32 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6-8, 31 and 32, respectively, of copending Application No. 09/336,059. Although the conflicting claims are not identical, they are not patentably distinct from each other

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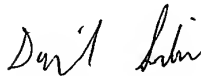
because claim 2, 6-8, 31 and 32 of 09/336,059 includes all the limitations of instant claims 2, 6-8, 31 and 32, respectively.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Sorkin whose telephone number is 703-308-1121. The examiner can normally be reached on 8:00 -5:30 Mon.-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



David Sorkin

February 3, 2003



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